

What is claimed is:

1 1. A method for manufacturing a biochemical labeling
2 material, comprising:
3 providing a plurality of nanoparticles;
4 bonding the nanoparticles to a template molecule by
5 molecular imprinting;
6 polymerizing the nanoparticles to form a matrix with
7 uniformly-distributed template molecule; and
8 removing the template molecule from the matrix to
9 reveal a detection group of the matrix and leave
10 a cavity with specific area.

1 2. The method for manufacturing a biochemical
2 labeling material as claimed in claim 1, wherein the
3 nanoparticles are metal.

1 3. The method for manufacturing a biochemical
2 labeling material as claimed in claim 2, wherein the
3 nanoparticles are Au, Ag, Ni, or Co.

1 4. The method for manufacturing a biochemical
2 labeling material as claimed in claim 1, wherein the
3 nanoparticles are metal oxide.

1 5. The method for manufacturing a biochemical
2 labeling material as claimed in claim 4, wherein the
3 nanoparticles are iron oxide.

1 6. The method for manufacturing a biochemical
2 labeling material as claimed in claim 1, wherein the
3 nanoparticles are semiconductors.

1 7. The method for manufacturing a biochemical
2 labeling material as claimed in claim 6, wherein the
3 nanoparticles are II-VI or III-V group semiconductors.

1 8. The method for manufacturing a biochemical
2 labeling material as claimed in claim 6, wherein the
3 nanoparticles have core-shell structure of at least two
4 semiconductors.

1 9. The method for manufacturing a biochemical
2 labeling material as claimed in claim 1, wherein the
3 surface of nanoparticles is further functionalized prior to
4 bonding with template molecules.

1 10. The method for manufacturing a biochemical
2 labeling material as claimed in claim 9, wherein the
3 surface of nanoparticles is functionalized by fluorescent
4 molecules.

1 11. The method for manufacturing a biochemical
2 labeling material as claimed in claim 10, wherein the
3 fluorescent molecule is dansyl-chloride, anthracene,
4 pyrene, coumarine, n-vinylcarbazole or derivatives thereof.

1 12. The method for manufacturing a biochemical
2 labeling material as claimed in claim 9, wherein the
3 surface of nanoparticles is functionalized by electron-
4 transfer molecules.

1 13. The method for manufacturing a biochemical
2 labeling material as claimed in claim 12, wherein the
3 electron-transfer molecule is amine, porphine, fullerene,
4 organophosphine, carotene or derivatives thereof.

1 14. The method for manufacturing a biochemical
2 labeling material as claimed in claim 9, wherein the
3 surface of nanoparticles is functionalized by (3-
4 mercaptopropyl) trimethoxy silane or (3-aminopropyl)
5 trimethoxy silane to form a functional group thereon, able
6 to bond to the template molecule by hydrogen bonding.

1 15. The method for manufacturing a biochemical
2 labeling material as claimed in claim 9, wherein the
3 surface of nanoparticles is functionalized by (4-vinyl
4 pyridine) or allyl mercaptothiol to form an unsaturated
5 double-bond thereon.

1 16. The method for manufacturing a biochemical
2 labeling material as claimed in claim 9, wherein the
3 surface of nanoparticles is functionalized by (3-
4 mercaptopropyl) trimethoxy silane) or vinyl trimethoxy
5 silane to form an unsaturated double-bond thereon.

1 17. The method for manufacturing a biochemical
2 labeling material as claimed in claim 1, wherein a
3 functional monomer, a crosslinking agent, and an initiator
4 are further added during polymerization of nanoparticles.

1 18. A biochemical labeling material manufactured by a
2 method comprising:
3 providing a plurality of nanoparticles;
4 bonding the nanoparticles to a template molecule by
5 molecular imprinting;
6 polymerizing the nanoparticles to form a matrix with
7 uniformly-distributed template molecule; and
8 removing the template molecule from the matrix to
9 reveal a detection group of the matrix and leave
10 a cavity with specific area.

1 19. A biochemical labeling material as claimed in
2 claim 18, wherein the nanoparticles are metal.

1 20. A biochemical labeling material as claimed in
2 claim 19, wherein the nanoparticles are Au, Ag, Ni, or Co.

1 21. A biochemical labeling material as claimed in
2 claim 18, wherein the nanoparticles are metal oxide.

1 22. A biochemical labeling material as claimed in
2 claim 21, wherein the nanoparticles are iron oxide.

1 23. A biochemical labeling material as claimed in
2 claim 18, wherein the nanoparticles are semiconductors.

1 24. A biochemical labeling material as claimed in
2 claim 23, wherein the nanoparticles are II - VI or III-V
3 group semiconductors.

1 25. A biochemical labeling material as claimed in
2 claim 23, wherein the nanoparticles have core-shell
3 structure of at least two semiconductors.

1 26. A biochemical labeling material as claimed in
2 claim 18, wherein the surface of nanoparticles is further
3 functionalized prior to the bonding with template molecule.

1 27. A biochemical labeling material as claimed in
2 claim 26, wherein the surface of nanoparticles is
3 functionalized by fluorescent molecule.

1 28. A biochemical labeling material as claimed in
2 claim 27, wherein the fluorescent molecule is dansyl-
3 chloride, anthracene, pyrene, coumarine, n-vinylcarbazole
4 or derivatives thereof.

1 29. A biochemical labeling material as claimed in
2 claim 26, wherein the surface of nanoparticles is
3 functionalized by electron-transfer molecule.

1 30. A biochemical labeling material as claimed in
2 claim 29, wherein the electron-transfer molecule is amine,
3 porphine, fullerene, organophosphine, carotene, or
4 derivatives thereof.

1 31. A biochemical labeling material as claimed in
2 claim 26, wherein the surface of nanoparticles is
3 functionalized by (3-mercaptopropyl) trimethoxy silane or
4 (3-aminopropyl) trimethoxy silane to form a functional
5 group thereon, able to bond to the template molecule by
6 hydrogen bond.

1 32. A biochemical labeling material as claimed in
2 claim 26, wherein the surface of nanoparticles is
3 functionalized by (4-vinyl pyridine) or allyl mercaptothiol
4 to form an unsaturated double-bond thereon.

1 33. A biochemical labeling material as claimed in
2 claim 26, wherein the surface of nanoparticles was
3 functionalized by (3-mercaptopropyl) trimethoxy silane) or
4 vinyl trimethoxy silane to form an unsaturated double-bond
5 thereon.

1 34. A biochemical labeling material as claimed in
2 claim 18, wherein a functional monomer, a crosslinking
3 agent, and an initiator are further added during
4 polymerization of nanoparticles.